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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,004	07/10/2001	Yukihiro Yoshimine	P107336-00025	7630

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EXAMINER
MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
1753	15

DATE MAILED: 07/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-15

Office Action Summary	Application No.	Applicant(s)	
	09/901,004	YOSHIMINE ET AL.	
	Examin r	Art Unit	
	Brian L. Mutschler	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *12 May 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 12, 2003 has been entered.

Comments

2. In light of Applicant's response, the rejection of claims 1, 2, 5 and 7-9 under 35 U.S.C. 103 over Komori et al., Yamada et al. and Admissions of prior art has been revised to more clearly state the Examiner's position, particularly with regard to the resin film.

Drawings

3. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on May 12, 2003 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "the solar cell" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. It is suggested that the phrase be changed to --the solar cells-- to reflect the amendment to claim 1.

Claim 8 recites the limitation "the solar cell" in line 5. There is insufficient antecedent basis for this limitation in the claim. It is suggested that the phrase be changed to --the solar cells-- to reflect the amendment to claim 1. The same applies to dependent claim 9.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 3 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Kataoka et al. (U.S. Pat. No. 6,307,145), with evidence of physical properties provided by "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics, Volume 2* (pp. 50-51) and "Common Shrinkage Values" from GE Polymerland.

Kataoka et al. disclose a solar cell having a front surface protective layer **103**, a rear surface film **105**, and a solar cell **101** and resin film **108** sealed by sealing resin **102** and **104** (fig. 1A). The resin film **108** is smaller than the front and rear surface protective layers **103** and **105** (fig. 1A). Kataoka et al. also teach, "Another arrangement may be such that photovoltaic elements are integrated on an insulated substrate to achieve desired voltage or current" (col. 10, lines 50-54), i.e., a plurality of solar cell elements may be used on a single substrate, wherein a module made using the disclosed solar cell elements would have a resin film **108** covering the area including an array of the solar cell elements.

Regarding claim 3, the resin films **105** and **108** are resistant to thermal expansion and thermal contraction and can be cross-linked to enhance heat resistance (col. 8, lines 36-39; col. 11, lines 1-4). Resin film **105** can be made using polyethylene terephthalate (col. 8, line 40-42), which has a heat shrinkage rate less than 1.0% (see "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics, Volume 2* (pp. 50-51)). Resin film **108** is made of materials including acrylic resins (col. 10, lines 61-65), which have heat shrinkage rates less than 1.0% (see "Common Shrinkage Values" from GE Polymerland). (The heat shrinkage rate is an inherent property of materials.)

Regarding claim 5, the resin film **108** is smaller than the overlaying area of the front and back surface protective layers **103** and **105** (fig. 1A).

Since Kataoka et al. teach the limitations recited in the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori et al. (EP 0 829 909 A2) in view Yamada et al. (EP 0 860 886 A2).

Komori et al. disclose a solar cell module having a front surface protecting layer **104**, a rear surface protecting layer **107**, an inorganic fibrous sheet **102**, an adhesive **105** and an insulating resin film **106** and a solar cell **101** sealed by a sealing resin **103** (fig. 1B). The inorganic fibrous sheet **102** and the resin film **106** are smaller in size than the front and rear surface protecting layers **104** and **107** (p. 4, lines 7-14; p. 6, lines 45-55). The inorganic fibrous sheet **102** comprises a nonwoven glass fiber cloth using an acrylic resin as a binder (p. 4, lines 22-24), i.e., the inorganic fibrous sheet **102** can be called a resin sheet or film. The resin film **106** has "long-term durability...against thermal expansion and thermal shrinkage" (p. 6, line 50).

Komori et al. disclose a specific example comprising a cell block **401** having a plurality of solar cells (see p. 8, line 53 to p. 10, line 13), wherein the front surface protective layer **404** was larger than the solar cell block **401** by 90 mm on each side, the inorganic fibrous sheet **402** comprising the acrylic resin binder was larger than the cell block **401** by 5 mm on each side, the insulating resin film **407** was larger than the solar cell block **401** by 15 mm on each side, and the rear surface protective layer **408** was larger than the solar cell block **401** by 80 mm on each side (p. 9, lines 52-54; p. 10, lines 2-13). Therefore, the inorganic fibrous sheet **402** was about 75 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block **401**, and the insulating resin film **407** was about 65 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block **401**. Making the inorganic sheet **402** (**102**) smaller than the other layers "prevents the formation of a moisture migration path" (p. 4, lines 3-14).

Regarding claim 5, the insulating resin film **106** is "disposed so as not to be present at the bending portion of the substrate" and is smaller in size than the protective layers **104** and **107** (p. 6, lines 46-47; fig. 1B).

Regarding claims 8 and 9, Komori et al. further disclose the use of a glass front surface protective layer **104** and a steel sheet rear surface protective layer **107** (p. 5, line 58; p. 7, line 5). The resin film **106** extends beyond the edges of the solar cell block **101** but does not reach the edges of the surface protective layers **104** and **107** (fig. 1B). The insulating resin film **106** "ensures a sufficient electrical insulation of the electroconductive substrate" (p. 6, lines 49-50). Furthermore, Komori et al. show the

use of connectors **306** connecting adjacent solar cells **301**, all encapsulated within a sealing resin **302** (fig. 3). Komori et al. also disclose the use of an insulating tape **208** on the solar cell output terminal **206a** (p. 9, lines 11-13).

The solar cell module of Komori et al. differs from the instant invention because Komori et al. do not disclose the formation of the solar cells within the sealing resin, as recited in claim 1, the use of wiring, as recited in claim 8, and the use of insulating tape covering the wiring, as recited in claim 9.

Regarding claim 1, Yamada et al. disclose the formation of a solar cell module comprising a front protective member **104**, a rear protective member **101**, a solar cell **102** and a resin insulating film **105**, wherein the solar cell **102** and resin insulating member **105** are contained within a sealing resin **103** (fig. 1). The sealing material **103** completely contains the solar cell **102** and the resin film **105** to "protect the solar cell device from stress or the like from the outside" (p. 3, lines 45-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the sealing resin of Komori et al. to completely contain the solar cell and resin film as taught by Yamada et al. because completely enclosing the solar cell device within the sealing resin would "protect the solar cell device from stress or the like from the outside" (p. 3, lines 45-46).

Regarding claims 8 and 9, wires and connectors, such as those disclosed by Komori et al. are equivalent because they perform in exactly the same manner, i.e.

conducting electricity from one device to another through the use of a thin electrically-conductive material. It is also well known to use insulating tape to cover exposed wiring in electrical applications to prevent short-circuiting and also to protect against electrical shock. For example, electrical tape is extensively used by electricians and others making electrical connections because it offers a simple and efficient means of insulating exposed conductors. Additionally, Komori et al. teach the use of insulative tape **208** on a positive side terminal **206a** (p. 9, lines 11-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module of Komori et al. to use wiring and to cover the wiring with insulating tape because it is well known in the art of solar cells and the field of electrical devices to use wiring and insulating tape in electrical connections because it provides simple and efficient means for connecting electrical devices.

10. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori et al. (EP 0 829 909 A2) in view Yamada et al. (EP 0 860 886 A2), as applied above to claims 1, 5, 8 and 9, and further in view of Admissions of prior art made in the instant specification.

Komori et al. and Yamada et al. describe a solar cell module having the limitations recited in claims 1, 5, 8 and 9 of the instant invention, as explained above in section 9.

Regarding claim 2, Komori et al. further disclose the use of a glass front surface protective layer **104** and a resin film rear surface protective layer **107** (p. 5, line 58; p. 7, line 16).

Regarding claim 7, Komori et al. disclose a specific example, wherein the front surface protective layer **404** was larger than the solar cell block by 90 mm on each side, the inorganic fibrous sheet **402** comprising the acrylic resin binder was larger than the cell block **401** by 5 mm on each side, the insulating resin film **407** was larger than the solar cell block by 15 mm on each side, and the rear surface protective layer **408** was larger than the solar cell block by 80 mm on each side (p. 10, lines 2-13).

The solar cell module of Komori et al. and Yamada et al. differs from the instant invention because they do not disclose the use of a *transparent* resin film as the rear surface protective layer, as recited in claim 2.

In the disclosure of the instant application, it was disclosed that it is known in the art to use a solar cell module capable of receiving light from both the front and the back surfaces of the module by using a glass front surface protective layer **100** and a rear surface protective member comprising a transparent resin film **110** (p. 1, line 17 to p. 2, line 8).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module described by Komori et al. and Yamada et al. to use a transparent rear surface protective layer as disclosed in the instant application as prior art because using a transparent rear surface protective layer

would allow the solar cell to absorb light through both the front and rear surfaces of the solar cell module.

11. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (U.S. Pat. No. 6,307,145), with evidence of physical properties provided by "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics, Volume 2* (pp. 50-51).

Kataoka et al. disclose a solar cell module having the limitations recited in claims 1, 3 and 5 of the instant application, as explained above in section 7. The solar cell module has a front surface protective layer **103**, a rear surface film **105**, and a solar cell **101** and resin film **108** sealed by sealing resin **102** and **104** (fig. 1A). The resin films **105** and **108** are resistant to thermal expansion and thermal contraction and can be cross-linked to enhance heat resistance (col. 8, lines 36-39; col. 11, lines 1-4).

Regarding claims 2 and 4, resin film **105** can be made using polyethylene terephthalate (col. 8, line 40-42), a transparent resin that has a heat shrinkage rate of less than 1.0% (see "Polyethylene Terephthalate (PET)" from *The Loctite Design Guide for Bonding Plastics, Volume 2* (pp. 50-51)). (The heat shrinkage rate polyethylene is an inherent property of the material.)

Kataoka et al. further disclose a comparative example, wherein the front surface protective layer **103** is made of glass, which has "the oxygen permeability and the water vapor permeability of zero" (col. 14, lines 20-37).

The solar cell module disclosed by Kataoka et al., as depicted in Figure 1A, differs from the instant invention because Kataoka et al. do not disclose an example of a solar cell module comprising both a front glass protective layer and a transparent resin film as the rear surface protecting layer, as recited in claim 2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell module disclosed in the first solar cell module disclosed by Kataoka et al. to use a glass front protective member as taught in a second example of Kataoka et al. because glass has a water vapor permeability of zero, which would protect the solar cell from moisture.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al. (U.S. Pat. No. 6,307,145) in view of Komori et al. (EP 0 829 909 A2).

Kataoka et al. disclose a solar cell module having the limitations recited in claims 1, 3 and 5 of the instant application, as explained above in section 7. Kataoka et al. further show that the resin layer **108** is the same size as the solar cell **101** so that both are completely surrounded by the sealing resin **102, 104** when fabricated (fig. 1A). This allows the sealant to completely seal the solar cell **101** from the outside.

The solar cell module of Kataoka et al. differs from the instant invention because Kataoka et al. do not clearly disclose how far the resin film is from the edge of the front and rear protective members.

Komori et al. disclose a specific example, wherein the front surface protective layer **404** was larger than the solar cell block by 90 mm on each side, the inorganic

fibrous sheet **402** comprising the acrylic resin binder was larger than the cell block **401** by 5 mm on each side the insulating resin film **407** was larger than the solar cell block by 15 mm on each side, and the rear surface protective layer **408** was larger than the solar cell block by 80 mm on each side (p. 9, lines 52-54; p. 10, lines 2-13). Therefore, the inorganic fibrous sheet **402** was about 75 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block **401**, and the insulating resin film **407** was about 65 mm from the edges of the front and rear surface protective layers and was larger than the solar cell block **401**. Making the inorganic sheet **402** (**102**) smaller than the other layers "prevents the formation of a moisture migration path" (p. 4, lines 3-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the resin film of Kataoka et al. to fabricate the module such that the resin film is set at a distance from the edge of the protective layers as taught by Komori et al. because this improves the adhesion within the module and prevents the formation of moisture migration paths.

Response to Arguments

13. Applicant's arguments filed May 12, 2003 have been fully considered but they are not persuasive.

14. Regarding the rejection of claims 1, 3 and 5 under 35 U.S.C. 102 over Kataoka et al., Applicant has argued that Kataoka et al. does not disclose a plurality of solar cell elements and discloses only a module comprising a single element (see second full

paragraph beginning on page 4 of Applicant's response). This argument is not persuasive because Kataoka et al. teach, "Another arrangement may be such that photovoltaic elements are integrated on an insulated substrate to achieve desired voltage or current" (col. 10, lines 50-54). Therefore, Kataoka et al. also teach the use of a plurality of solar cell elements on a single substrate. Applicant further suggests, "if the solar cell according to Kataoka et al. were applied to a solar cell module comprising a plurality of solar cells, as required in the claimed invention, water would be able to intrude from spaces between the solar cells" (see page 5 of Applicant's response). Even if Kataoka et al. did not disclose the use of a plurality of solar cell elements on a single substrate, it is noted that the ability to prevent the intrusion of water is not a feature claimed in the instant application.

15. The rejection of claims 1, 2, 5 and 7-9 over Komori et al., Yamada et al. and admissions made in the application has been revised to clarify the Examiner's position. The inorganic fibrous sheet **102** (**402**) disclosed by Komori et al. comprises an acrylic resin binder; therefore, the sheet **102** (**402**) can be considered a resin sheet (film) because it meets all of the limitations recited in the instant claim.

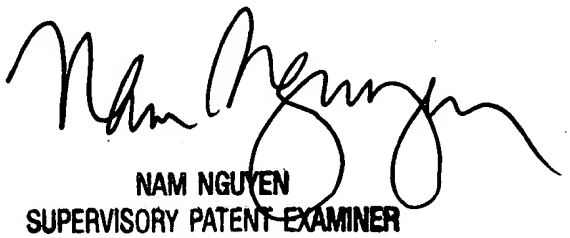
16. Applicant also argues, "each of the cited references Komori et al. and Yamada et al. teach a resin film provided on a single solar cell" (see page 7 of Applicant's response). This argument is not persuasive because Komori et al. discloses Example 1, which comprises a plurality of solar cells formed into a solar cell block **401** (see p. 8, lines 55-58), which is shown in Figures 3 and 4A.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



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blm
June 27, 2003